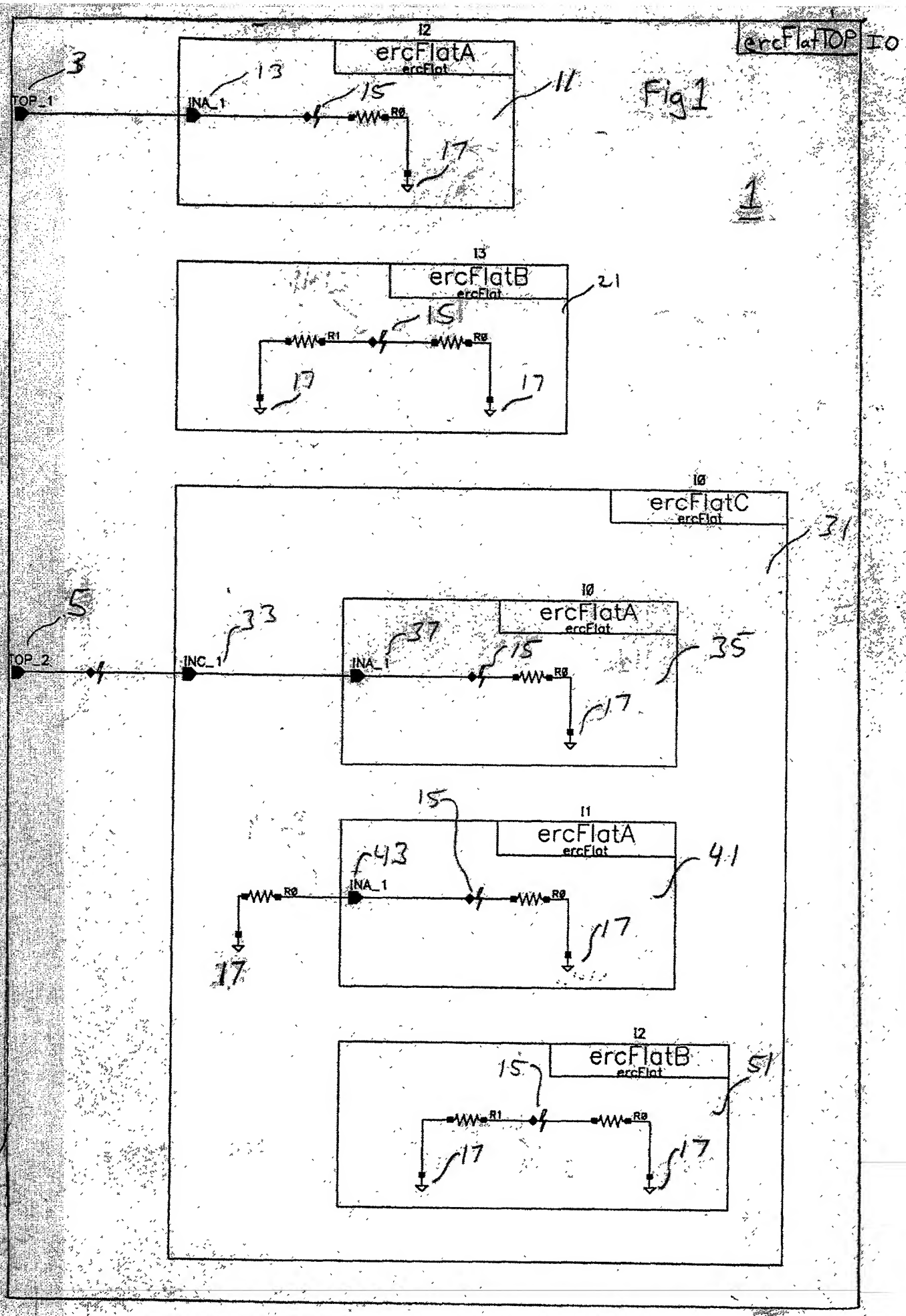
ercFlatTOP I0
I2
ercFlatA
ercFlat
3
TOP_1
13
INA_1
15
R0
11
17
Fig 1
1
I3
ercFlatB
ercFlat
21
15
R1
R0
17
17
I0
ercFlatC
ercFlat
31
I0
ercFlatA
ercFlat
5
TOP_2
33
INC_1
37
INA_1
15
R0
35
17
15
I1
ercFlatA
ercFlat
43
INA_1
41
R0
R0
17
17
I2
ercFlatB
ercFlat
15
51
R1
R0
17
17
2

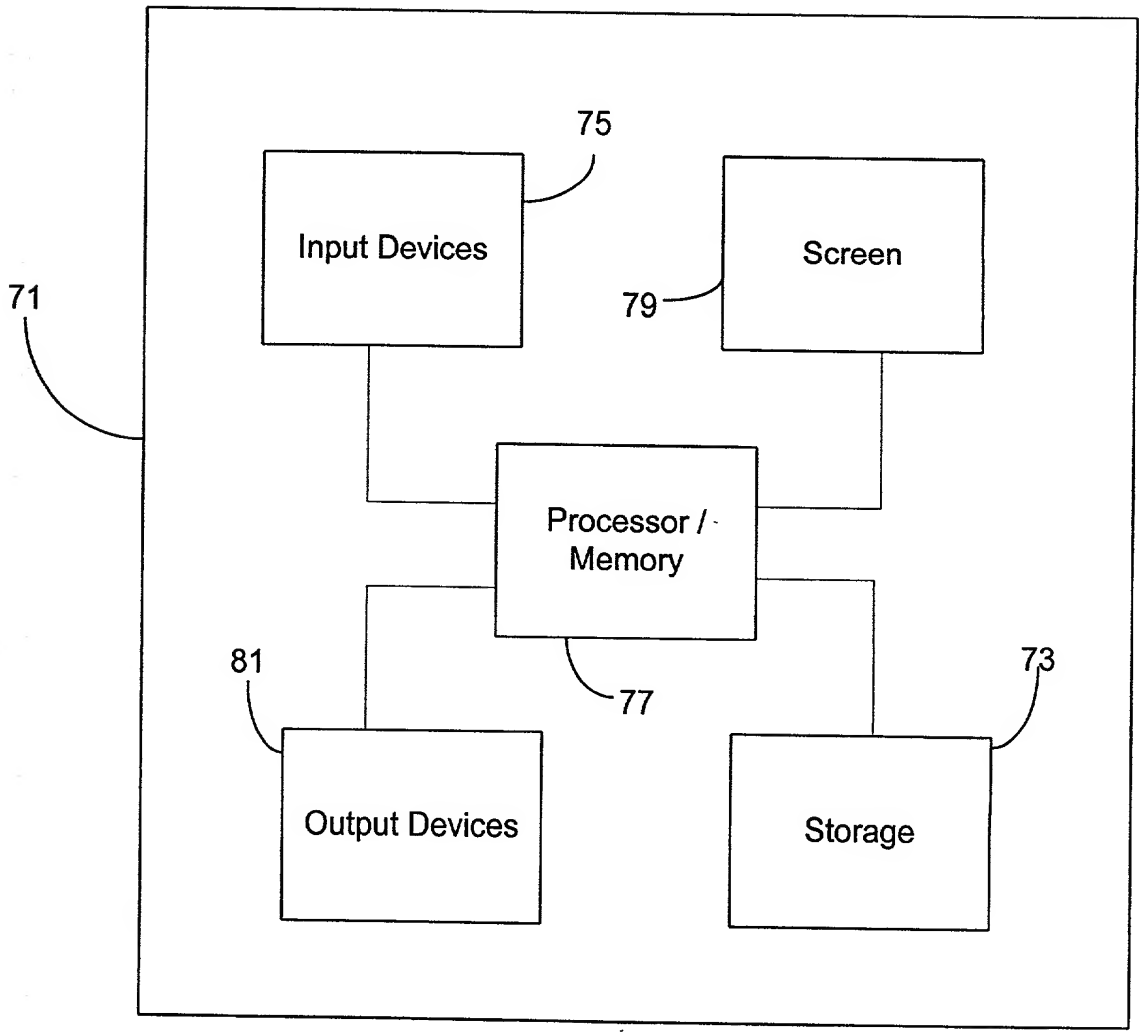
71
75
Input Devices
79
Screen
Processor / Memory
77
81
73
Output Devices
Storage

Fig. 2

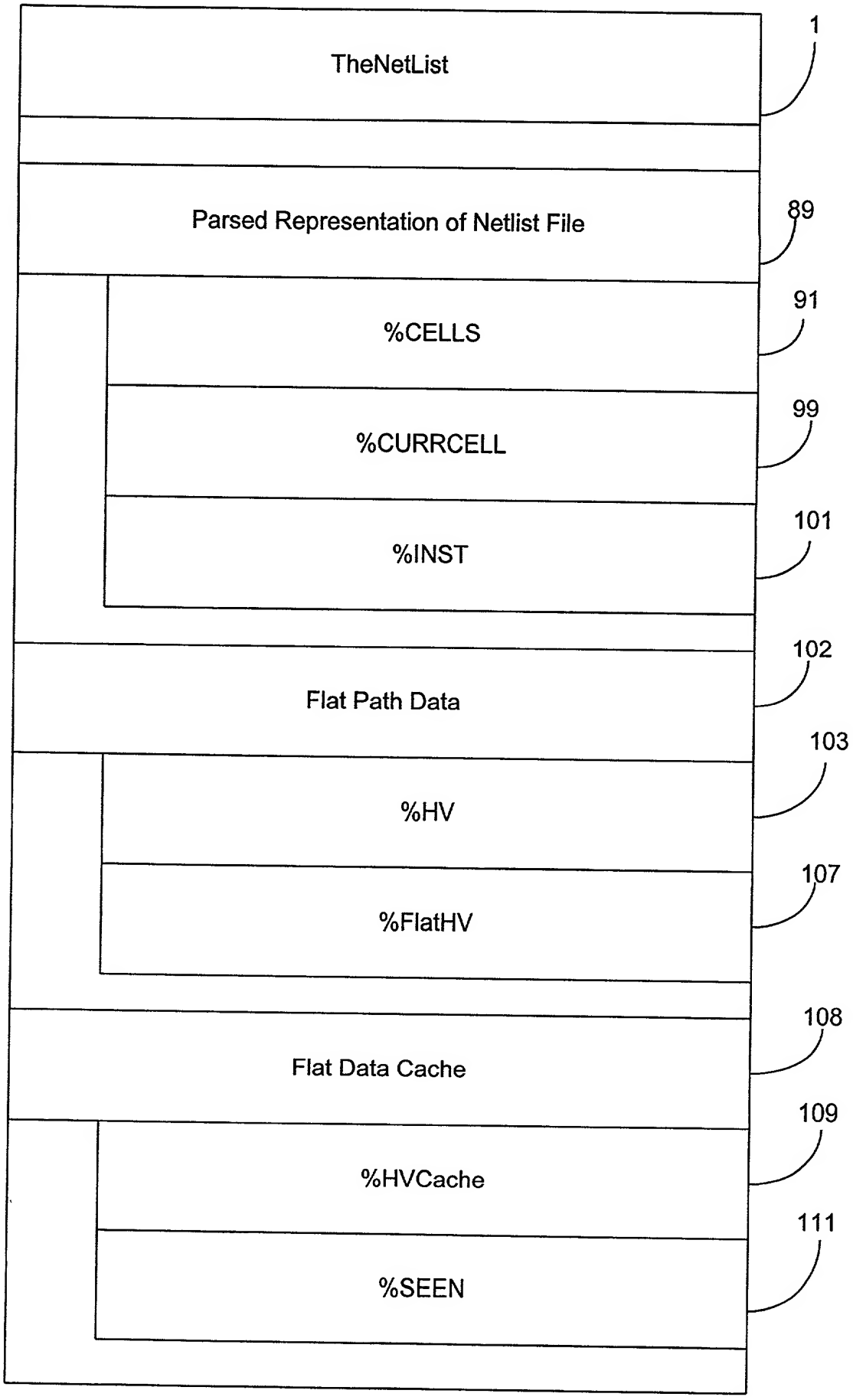
TheNetList
1
Parsed Representation of Netlist File
89
%CELLS
91
%CURRCELL
99
%INST
101
Flat Path Data
102
%HV
103
%FlatHV
107
Flat Data Cache
108
%HVCache
109
%SEEN
111

Fig. 3

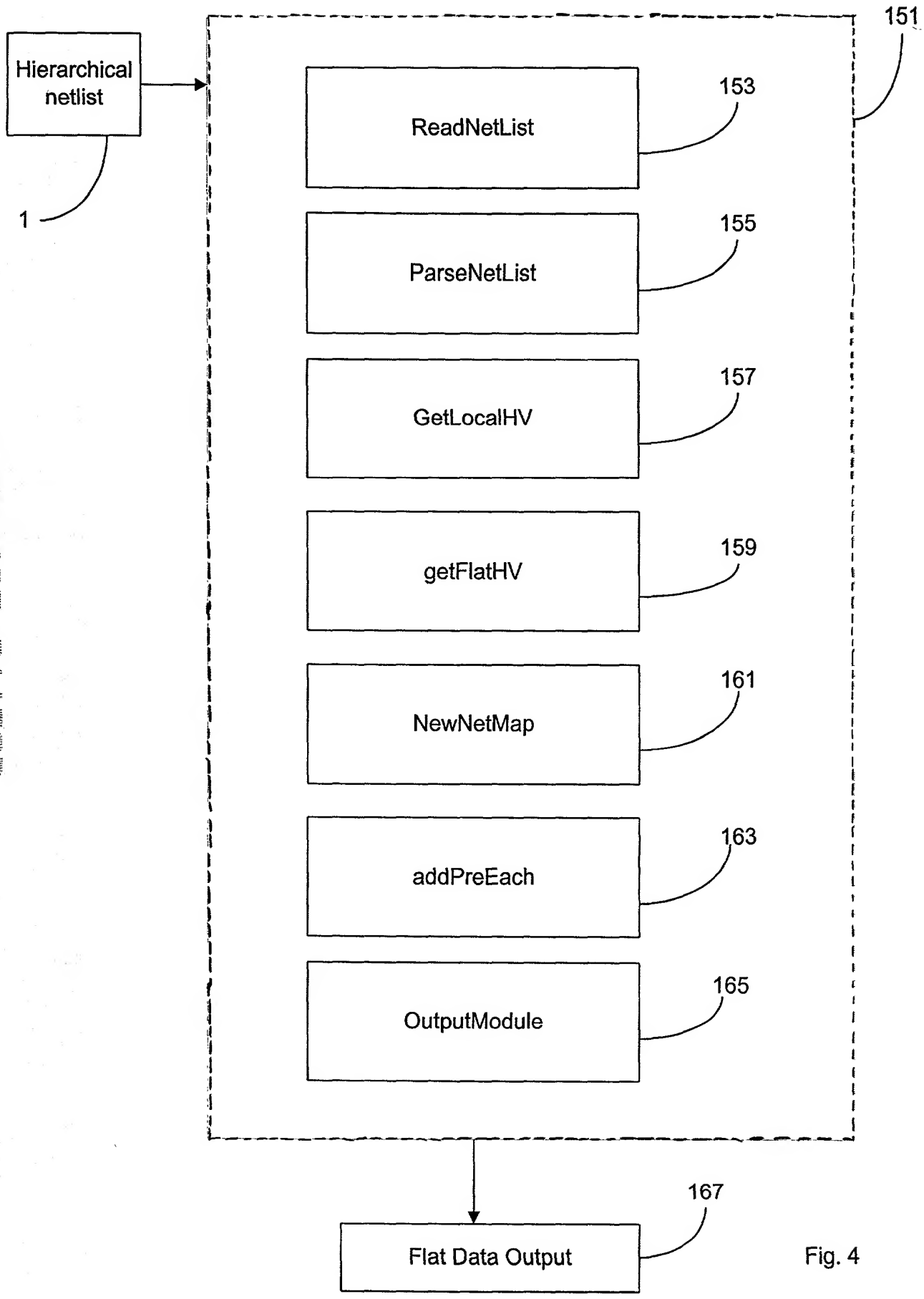
Hierarchical netlist
1
151
ReadNetList
153
ParseNetList
155
GetLocalHV
157
getFlatHV
159
NewNetMap
161
addPreEach
163
OutputModule
165
Flat Data Output
167

Fig. 4

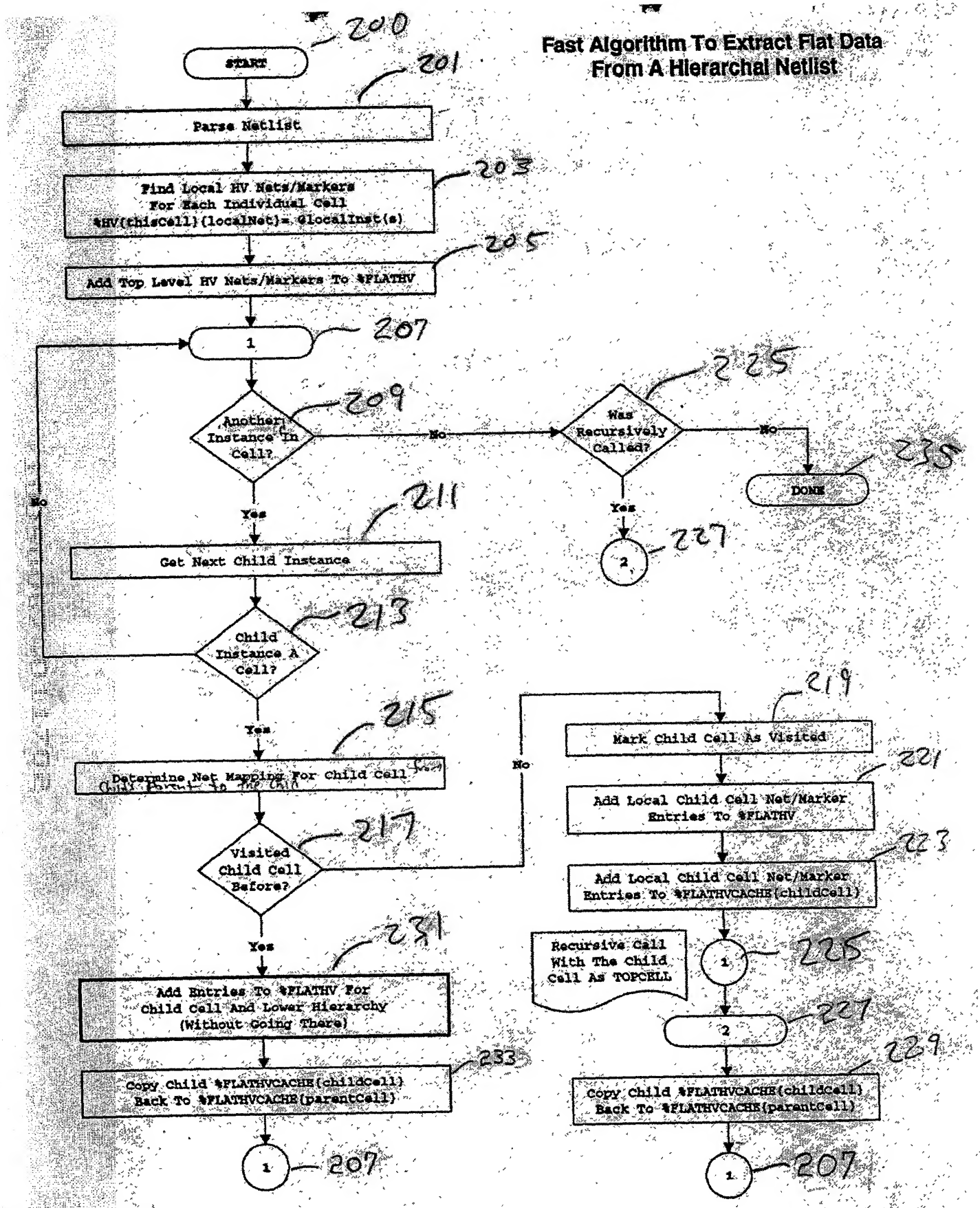
Fast Algorithm To Extract Flat Data From A Hierarchal Netlist
START
200
Parse Netlist
201
Find Local HV Nets/Markers For Each Individual Cell %HV{thisCell}{localNet}= @localInst(s)
203
Add Top Level HV Nets/Markers To %FLATHV
205
1
207
Another Instance In Cell?
209
No
Was Recursively Called?
225
No
DONE
235
Yes
2
227
No
Yes
Get Next Child Instance
211
Child Instance A Cell?
213
Yes
Determine Net Mapping For child cell
215
Visited Child Cell Before?
217
No
Mark Child Cell As Visited
219
Add Local Child Cell Net/Marker Entries To %FLATHV
221
Add Local Child Cell Net/Marker Entries To %FLATHVCACHE{childCell}
223
Recursive Call With The Child Cell As TOPCELL
1
225
2
227
Copy Child %FLATHVCACHE{childCell} Back To %FLATHVCACHE{parentCell}
229
1
207
Yes
Add Entries To %FLATHV For Child Cell And Lower Hierarchy (Without Going There)
231
Copy Child %FLATHVCACHE{childCell} Back To %FLATHVCACHE{parentCell}
233
1
207

Fig 5

PROGRAM OUTPUT

```
--------------------%HV...
inst=<ercFlatA>
  <INA_1> ------>( <X0> )
inst=<ercFlatB>
  <net2> ------>( <X0> )
inst=<ercFlatTOP>
  <TOP_2> ------>( <X0> )

--------------------%FLATHV...
/I0/net2------>( /I0/I1/X0 )
/TOP_1------>( /I2/X0 )
/I0/I2/net2------>( /I0/I2/X0 )
/I3/net2------>( /I3/X0 )
/TOP_2------>( /X0 /I0/I0/X0 )

--------------------%FLATHVCACHL...
Cell=<ercFlatA>
  Flat
    INA_1------>( X0 )
  Check
  Deep
Cell=<ercFlatB>
  Flat
  Check
  Deep
    net2------>( X0 )
Cell=<ercFlatTOP>
  Flat
  Check
    TOP_1------>( I2/X0 )
    TOP_2------>( I0/I0/X0 )
  Deep
    I0/net2------>( I0/I1/X0 )
    I0/I2/net2------>( I0/I2/X0 )
    I3/net2------>( I3/X0 )
Cell=<ercFlatC>
  Flat
  Check
    net2------>( I1/X0 )
    INC_1------>( I0/X0 )
  Deep
    I2/net2------>( I2/X0 )

---------------------------------------
CPU Time:   0.00 minutes
---------------------------------------
START: Tue Nov 23 10:33:12 MST 1999
  END: Tue Nov 23 10:33:12 MST 1999
---------------------------------------
```

301

303

305

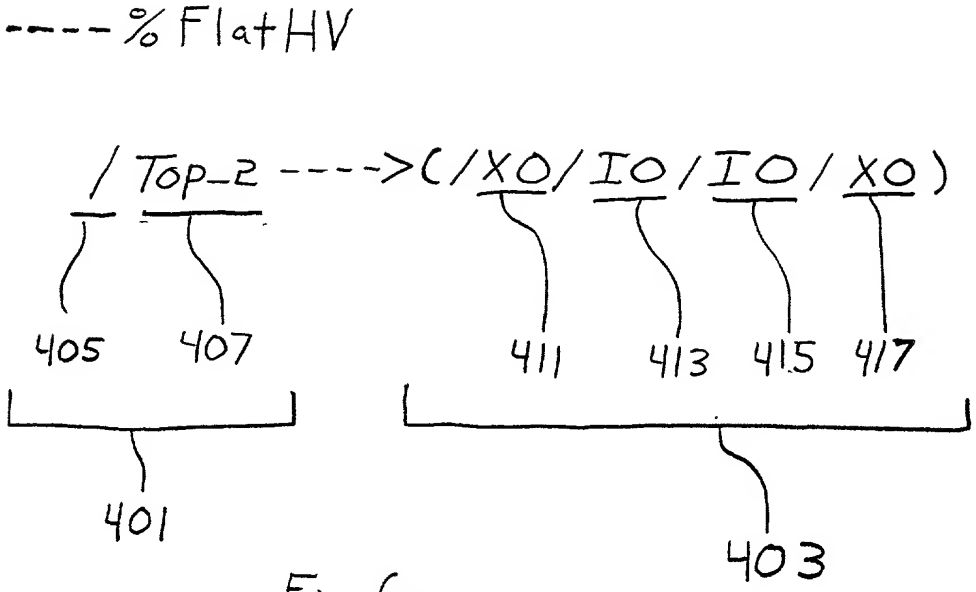

Fig. 6a